""EFFECTIVENESS OF CONVENTIONAL PHYSIOTHERAPY, HIGH INTENSITY INTERVAL TRAINING(HIIT) AND LOW VOLUME HIGH INTENSITY INTERVAL TRAINING(LOW VOLUME HIIT) ON BLOOD PRESSURE(BP), & WAIST TO HEIGHT RATIO(WHtR) IN PRIMARY HYPERTENSIVE INDIVIDUALS- AN EXPERIMENTAL STUDY"

A Dissertation Submitted to

THE TAMILNADU Dr. M.G.R. MEDICAL UNIVERSITY

CHENNAI

In partial fulfilment of the requirements

for the award of the

MASTER OF PHYSIOTHERAPY

Degree Programme

Submitted by

Reg.No : 271430207

PPG COLLEGE OF PHYSIOTHERAPY

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APRIL – 2016

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Under the guidance of

Prof.KS.RAJA SHENTHIL M.P.T (Cardio-Resp)., MIAP.,(PhD).,

A Dissertation submitted to

THE TAMILNADU Dr.M.G.R. MEDICAL UNIVERSITY

CHENNAI

Dissertation Evaluated on _____

Internal Examiner **External Examiner**

CERTIFICATE I

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This is to certify that the dissertation entitiled **"EFFECTIVENESS OF CONVENTIONAL PHYSIOTHERAPY, HIGH INTENSITY INTERVAL TRAINING(HIIT) AND LOW VOLUME HIGH INTENSITY INTERVAL TRAINING(LOW VOLUME HIIT) ON BLOOD PRESSURE(BP), & WAIST TO HEIGHT RATIO(WHtR) IN PRIMARY HYPERTENSIVE INDIVIDUALS- AN EXPERIMENTAL STUDY"**is a bonafide compiled work, carried out by **Register No: 271430207,** PPG College of Physiotherapy,Coimbatore-641035 in partial fulfillment for the award of degree in Master of Physiotherapy as per the doctrines of requirements for the degree from **THE TAMILNADU Dr. M.G.R. MEDICAL UNIVERSITY, CHENNAI-32.** This work was guided and supervised by **Prof. KS.RAJA SHENTHIL M.P.T (Cardio-Resp).,MIAP.,(PhD).,**

DATE: **PRINCIPAL**

PLACE:

ACKNOWLEDGEMENT

First I would like to thank the **Lord Almighty** and **My Parents**, **My Brothers and Friends** for their unfailing love, affection and endless blessings.

I express my sincere gratefulness to **Dr.L.P THANGAVELU M.S.,F.R.C.S., Chairman** and **Mrs.SHANTHI THANGAVELU M.A.,Correspondent**,PPG Group of institutions,Coimbatore for their encouragement and providing the source for the successful of the study.

With due respect,my most sincere thanks to **My Principal and Guide Prof. KS. RAJA SHENTHIL M.P.T (Cardio-Resp).,MIAP.,(PhD).,** who gave me his precious time and with his vast experience helped me to complete this dissertation successfully.

I would like to thank my Academic Incharge **Prof.Dr.M.SANKAR SAHAYARAJ M.P.T(Neurology),PGDSPT.,TTCY.,MIAP.,** for his valuable support throughout my studies.

I would like to thank my PG Class Co-ordinator **Prof.K.RAMADEVI M.P.T(Cardio-Resp)** for her valuable support throughout my studies.

Several special people have guided me and have contributed significantly to this effort. I thank my **faculty members** for their constant support and cheer all along in achieving the goal.

My hearty thanks to some Private Hospital Physiotherapists who gave me an opportunity to do my project work in their hospitals.

CONTENTS

CHAPTER I

EFFECTIVENESS OF CONVENTIONAL PHYSIOTHERAPY, HIGH INTENSITY INTERVAL TRAINING (HIIT) AND LOW VOLUME HIGH INTENSITY INTERVAL TRAINING (LOW VOLUME HIIT) ON BLOOD PRESSURE (BP), & WAIST TO HEIGHT RATIO (WHTR) IN PRIMARY HYPERTENSIVE INDIVIDUALS.

AN EXPERIMENTAL STUDY

I INTRODUCTION:

1.1 BACKGROUND OF THE STUDY:

A sedentary lifestyle has been characterized as an independent risk factor for cardio vascular disease[1].studies have shown the inverse association between physical activity level and the incidence of cardiovascular diseases[2].Historically,cvd has thought to be a disease endemic to developed countries only[3];However new evidence indicates that developing countries are more strongly affected by CVD than their affluent counterparts[123].

Hypertension is an important risk factor for cardio vascular disease (CVD) affecting about 1 billion people worldwide.Elevated BP levels have been shown to be a risk factor for stroke,congestive heart failure,myocardial infarction,peripheral vascular disease& end stage renal disease[1,2].Essential hypertension accounts for 95% of all cases of hypertension.Essential hypertension is the most common risk factor for cardiovascular morbidity and mortality,affecting approximately 1 billion individuals worldwide,and is associated with substantial health care expenditure[1,2,3]

Low aerobic fitness is a strong predictor for future CVD & all cause mortality in patients including those with hypertension [4].

The recent joint national committee on prevention,detection.,evaluation and treatment of high blood pressure,recommended that optimal blood pressure levels should be less than 120/80 mmHg, for resting systolic and diastolic blood pressure respectively.

Non-pharmocological intervention in the form of regular aerobic exercise has been recommended for the prevention of high blood pressure as well as the lowering of blood pressure among those individuals,with elevated level development of both hypertension and coronary artery disease(CAD)[56,.7].physical activity is recommended as prevention,treatment and physical inactivity is associated with increased risk of control of all stages of hypertension.regular exercise is a well-established intervention for the prevention and treatment of several chronic diseases,including hypertension.[8].Moreover, exercise can reduce BP in hypertensive adults[11],and has shown to improve several factors involved in the pathophysiology of hypertension[12.14].Continuous exercise training is the type of physical activity most frequently recommended to hypertensive subjects.However ,some studies have shown that interval exercise training may have greater effects on exercise capacity in healthy subjects and those with cardio vascular disorders.Interval training promotes greater gradients of shear stress because patients fluctuate between high and low intensities[14.15.16].In a study lu et al state that HIIT is safe even for patients with high chronic disease with stable angina.HIIT may also contest modern medical treatments in improving systolic and diastolic blood pressure,with significant decreases of 12 and 8 mmHg,respectively in patients with hypertension[17].It was also established that HDL was increased by 25% in the HIIT group[18].

Interval training works both the aerobic and the anaerobic system.During the high intensity efforts ,the anaerobic system uses the energy stored in the muscles (glycogen)for short bursts of activity.Interval training adheres to the principles of adaptation.Interval training leads to many physiological changes including an increase in cardiovascular efficiency(the ability to deliver oxygen to the working muscles)as well as increased tolerance to the build up of lactic acid[19].In a meta analysis of indices of abdominal obesity ,lee et al reported that BMI was the poorest discriminator ,whilst WHtR was the best discriminator for hypertension,for both men and women[20].other investigators have reported that WHtR is the best predictor of CVD risk & other cardiometabolic risk factors including hypertension than other anthropometric measurements[20-26]

considerable evidence currently exists to support a role for low volume hit as a potent and time-efficient training method for inducing both central (cardiovascular)and peripheral(skeletal muscle)adaptations that are linked to improved health outcomes.Limited work has examined the application of low-volume HIIT in people with,or at risk for,cardio metabolic disorders ,and at present the potential benefits of this type of training are unclear.

1.2NEED OF THE STUDY:

Much of the work conducted to date has involved relatively high volume protocols in which, HIIT has been shown to improve significant improvements in various components of resting BP,but recent work has shown that it could be that the short intense bursts of activity with low volume HIIT appears to produce this type of cardiac remodelling.

So, Inspite of the preliminary evidence with short intervention periods(lasting up to several weeks),future work involving long term(months to years)interventions in hypertensive populations are urgently needed to better understand how manipulating exercise stimulus impacts on cardiovascular remodeling & to resolve whether low volume HIIT is a time-efficient exercise alternative to HIIT in normalizing BP and other hypertension discriminators in primary hypertensive populations.

1.3AIM OF THE STUDY:

To find out the effectiveness of conventional physiotherapy, high intensity interval training(HIIT) vs low volume high intensity interval training(low volume HIIT) on blood pressure and waist to height ratio(WHtR) in primary hypertensive individuals .

1.4OBJECTIVES OF THE STUDY:

- To find out the effectiveness of conventional physiotherapy on systolic blood pressure in primary hypertensive population.
- To find out the effectiveness of conventional physiotherapy on diastolic blood pressure in primary hypertensive population.
- To find out the effectiveness of conventional physiotherapy on waist to height ratio in primary hypertensive population.

- To find out the effectiveness of HIIT on systolic blood pressure in primary hypertensive population
- To find out the effectiveness of HIIT on diastolic blood pressure in primary hypertensive population
- To find out the effectiveness of HIIT on waist to height ratio in primary hypertensive population
- To find out the effectiveness of low -volume HIIT on systolic blood pressure in primary hypertensive individuals.
- To find out the effectiveness of low -volume HIIT on diastolic blood pressure in primary hypertensive individuals.
- To find out the effectiveness of low -volume HIIT on waist to height ratio in primary hypertensive individuals
- To compare the effectiveness of conventional physiotherapy,HIIT and low -volume HIIT on systolic, diastolic and waist to height ratio in primary hypertensive individuals.

1.5RESEARCH HYPOTHESIS:

NULLHYPOTHESIS:

There would not be any significant difference in the effectiveness of conventional physiotherapy, HIIT and low-volume HIIT on blood pressure and waist –to-height ratio in primary hypertensive individuals.

ALTERNATE HYPOTHESIS:

There would be a significant difference in the effectiveness of conventional physiotherapy,HIIT and low-volume HIIT on blood pressure and waist –to-height ratio in primary hypertensive individuals.

1.6OPERATIONAL DEFINITIONS:

HIIT:high intensity interval training (HIIT) describes physical exercise that is characterized by brief,intermittent bursts of vigorous activity interspersed by periods of rest or low intensity exercise ***jphysiol*590.5 (2012) pp 1077–1084 1077**

LOW-VOLUME HIIT:

It is defined as a type of HIIT in which the duration of exercise is reduced and the most common model employed consists of a 30s all out cycling effort against a supra maximal workload 4to6 times separated by 4min of recovery for a total of 20 minutes training session.

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ESSENTIAL/PRIMARY HYPERTENSION:

Essential/primary/idiopathic hypertension is defined as high bp in which secondary causes such asrenovasculardisease,renalfailure,pheochromocytoma,aldosteronism,orother causes of secondary hypertension or mendelian forms are not present.

(American Heart Association)aha.journalpublished ,january 25 ,2000,in part i issue of circulation

CARDIO VASCULAR DISEASE:

Heart and blood vessel disease-also called heart disease-includes numerous problems many of which are related to a process called atherosclerosis .ex:arrhythmia, heart valve problem, heartfailure, stroke, ischaemic heart disease.

American Heart Association-12.18.2014

CHAPTER II

REVIEW OF LITERATURE

1.TIM SHIRAEV,GABRIELLA BARCLAY-EVIDENCE BASED EXERCISE,CLINICAL EFFECTS OF HIGH INTENSITY INTERVAL TRAINING(DECEMBER 2012):

HIIT is associated with increased patient compliance and improved cardiovascular and metabolic outcomes and is suitable for implementation in both healthy and in ‘’risk ‘’populations.

2.KASSIA S WESTON,ULRIK WISLOFF,JEFF S COOMBES-HIIT IN PATIENTS WITH LIFESTYLE INDUCED CARDIO METABOLIC DISORDERS:A SYSTEMATIC REVIEW AND META ANALYSIS:21-OCT.2013

HIIT significantly increases cardio respiratory fitness by almost double that of MICT in patients with life-style induced cardio metabolic disorders.

3.EMMANUEL GOMES CIOLAC-JUNE 15 2012.HIIT AND HYPERTENSION WHETHER MAXIMIZING THE BENEFITS OF EXERCISE?

Essential hypertension is the most common risk factor for cardiovascular morbidity and mortality.there exists a compelling evidence suggesting larger benefits of HIIT for several factors involved in the pathophysiology of hypertension raises the hypothesis that HIIT may be more effective in preventing and controlling hypertension and its markers.

4.MARTIN.J.GIBALA,JONATHAN.P.LITTLE,MAUREEN.J.MACDONALD,JOHN.A.HAWLEY-PHYSIOLOGICAL ADAPTATION TO LOW VOLUME HIIT IN HEALTH AND DISEASE-JOURNAL OF PHYSIOLOGY PP 1077-1084- 590.5-2012

A growing body of evidence demonstrates that HIIT can serve as an effective alternate to traditional endurance-based training,inducing similar or even superior physiological adaptations in healthy individuals and diseased populations.while,less well studied,low volume HIIT can also stimulate physiological remodelling comparable to moderate intensity continuous training despite a substantially lower time commitment and reduced total exercise volume

5.DARREN.E.WARBURTON.PHD,;DONALD.C.MCKENZIE.MD,PHD;MARK,HAYKOWSKY.PHD;ARLANA TAYLOR ,PT,PARLA SHOEMAKER MSC;ANDREW.P.IGNASZEWKI,MD;SAMMY.Y.CHAN,MD-EFFECTIVENESS OF HIIT FOR THE REHABILITATION OF PATIENTS WITH CORONARY ARTERY DISEASE(AM.J.CARDIO 2005,95;1080-1084)

We found that interval training exercises provides an effective means to improve the cardio respiratory fitness in highly functional patients with coronary artery disease ,also it improves anaerobic tolerance to greater extent than the traditional exercise training model without increasing the risk of patient.

6.CRYSTAL MAN YING LEE(NUTRITION DIV,AUSTRALIA),RACHEL.R.HUXLEY(NUTRITION DIV AUSTRALIA),RACHEL.P.WILDMAN(DEPARTMENT OF EPIDEMIOLOGY AND PUBLIC HEALTH NY,USA),MARK.WOODWARD(DEPARTMENT OF MED,NY,USA)-INDICES OF ABDOMINAL OBESITY ARE BETER DISCRIMINATORS OF CARDIOMETABOLIC RISK FACTORS THAN BMI;A META ANALYSIS:2012 JOU.OF CLINICAL EPIDEMIOLOGY.

Statistical evidence suggests the superiority of measures of centralized obesity,especially whtr over bmi for detecting cardio vascular risk factors in both men and women.

7.EXERCISE AND CARDIOVASCULAR RISK IN PATIENTS WITH HYPERTENSIONJAMES E. SHARMAN,1 ANDRE LA GERCHE,2 AND JEFF S. COOMBES3

Regular exercise is one of the most important activities for primary prevention of hypertensionand improving long-term survival.Benefits of exercise extend to people with hypertension, people with hypertension are less physically active than those without hypertension.

CHAPTER III

METHODOLOGY

3.1STUDY DESIGN:

Experimental study.

3.2STUDY SETTING:

Sports performance assessment research and rehabilitation centre(sparrc)

3.3SAMPLE SIZE:

30 subjects

3.4STUDY DURATION:

6 months

3.5SAMPLING METHOD:

simple randomized sampling.

3.6INCLUSION CRITERIA:

- primary hypertensive subjects
- Both male and female subjects
- Hypertension with asymptomatic,,>2 risk factors (low risk subject)
- subjects with age ranging from18-50years

3.7EXCLUSION CRITERIA:

- Secondary hypertensive individuals.
- unstable angina pectoris
- uncompensated heart failure
- Recent myocardial infarction<4 weeks
- Recent cabg or percutaneous coronary intervention,<12months

- Heart disease that limits exercise(valvular,congenital,ischemic,hypertrophic cardiomyopathy)
- Ventricular arrhythmias and heart block
- Severe copd,cvd,uncontrolledpvd
- Uncontrolled diabetes mellitus
- Hypertensive subjects with bp>180/120or stage 3
- Severe neuropathy
- Chronic orthopaedic conditions

3.8Materials required:

- Exercise tread mill
- Omron digital bp apparatus
- Inch tape
- Wall mounted ht measuring device
- Maximum heart rate chart
- Calculator

3.9PROCEDURE:

It is an experimental study design with three groups , one control & 2 experimental group . As this study involves human subjects , ethical clearence was obtained as per the ethical guidelines of PPG college of physiotherapy ethical committee.

The subjects willing to participate in the experimental study will be informed about the aim, the potential benefits ,discomforts and protocol to be followed.After receiving willingness approval or informed consent,30 subjects based on the selection criteria will be chosen. Out of 30 subjects,through randomized sampling 10 each in group a , group b and c will be allocated.All subjects were asked to refrain from both strenuous physical activities and the consumption of any stimulants (e.g., coffee, tobacco, and alcohol) that might influence heart rate for 24 hours prior to the exercise.

The maximum exercise heart rate predicted for age was calculated by subtracting the subject's age from 220.Through omron digital bp apparatus pre and post pressure was recorded.Simultaneously,by inch tape waist circumference with height pre and post exercise noted.

3.10 TREATMENT PROTOCOL:

Group acontrol group will be assigned for conventional aerobic exercise –mild and gentle walking at 50% PHR in exercise tread mill

Group B/ HIIT experimental up will follow the HIIT protocol in exercise tread mill

Group C LV HIIT experimental group will follow the LV HIIT protocol in exercise tread mill

Office /clinical systolic and diastolic blood pressure measurements after 5 mins rest in three different occasions pre and post test will be measured . Similarly,ratios of waist from navel level around to the height in cm will be measured pre and post study

CHAPTER IV

DATA ANALYSIS AND RESULTS

STATISTICAL TOOL:

Statistical analysis was being done using SPSS software comprising paired 't' test,one way Anova and post hoc tests.(bonferroni).within the three groups paired 't' test was calculated(table and figure 1) for systolic ,diastolic and WHtR pre and post comparisons which showed the mean, standard error mean ,'t'value and 0.000 significant p value as;

TABLE 1

PAIRED SAMPLE STATISTICS

		mean ±standard error mean	't'value	'p'value
pair 1	SYSCONPRE	159.0000±4.17133	21.000	.000
	SYSCONPOST	154.1000±4.02892		
pair 2	SYSHIITPRE	161.3000±4.76340	7.043	`.000
	SYSHIITPOST	145.0000±3.65148		
pair3	SYSLVPRE	169.7000±3.17648	17.778	.000
	SYSLVPOST	116.6000±2.34379		
pair4	DIACONPRE	100.9000±1.76037	7.203	.000
	DIACONPOST	98.1000±1.51621		

pair5	DIAHIITPRE	99.1000±2.54056	24.000	.000
	DIAHIITPOST	94.3000±2.41316		
pair6	DIALVPRE	105.7000±2.30000	13.128	.000
	DIALVPOST	80.5000±.88506		
pair7	WHTCONPRE	.6470±.02114		
	WHTCONPOST	.6270±.02114		
pair8	WHTHIITPRE	.7490±.01251	17.270	.000
	WHTHIITPOST	.7180±.01323		
pair9	WHTLVPRE	.7370±.03246	29.319	.000
	WHTLVPOST	.6260±.03324		

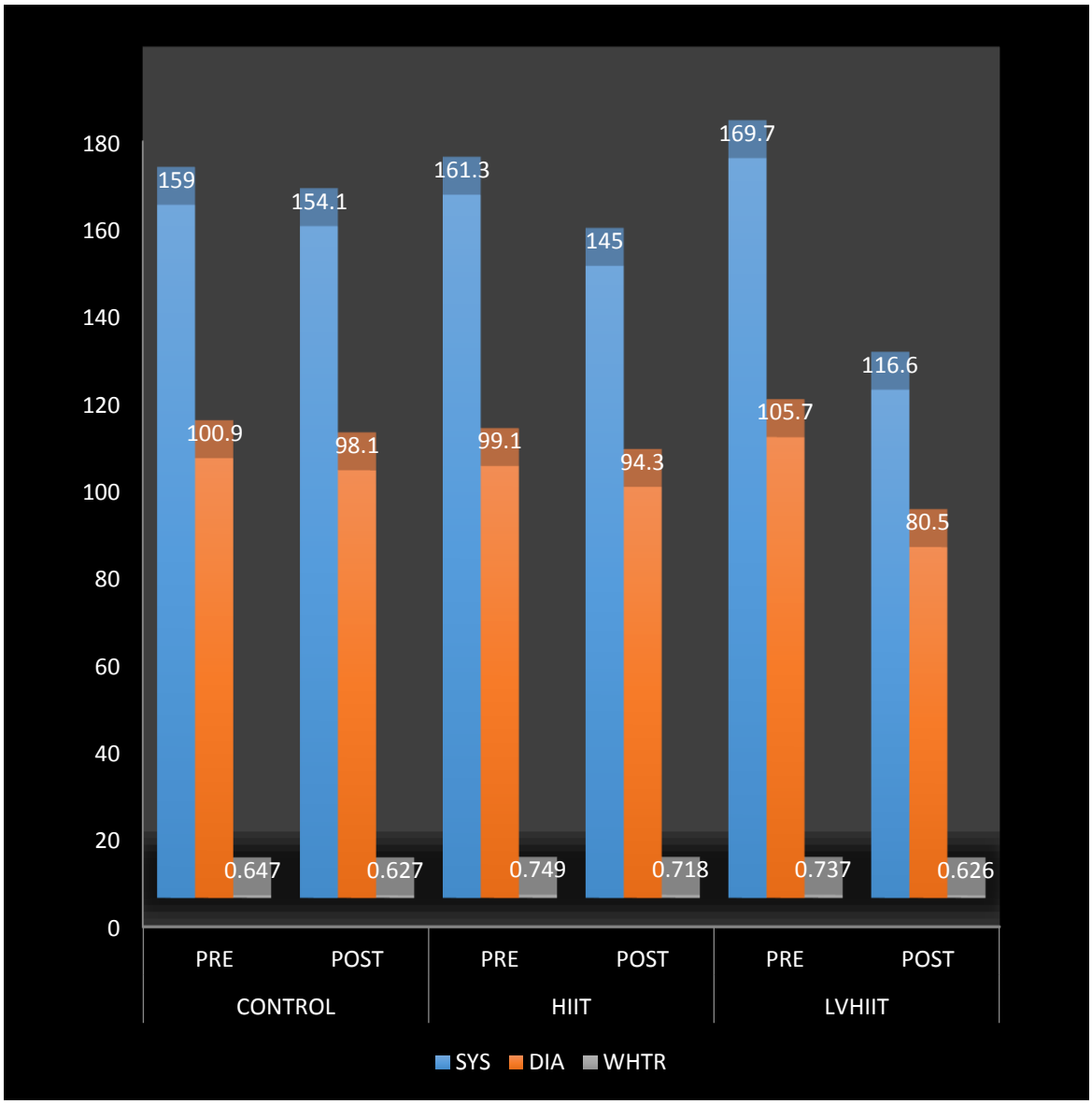

FIGURE 1-MEAN BAR GRAPH

In between group comparisons by one way anova and bonferroni (table 2), all the three groups had showed significant reduction in BP and WHtR but LVHIIT group was the greatest in both statistically and clinically significant level.Also the least significance was observed in waist to height ratio in between groups compared to blood pressure reduction.

ONE WAY-ANOVA

	Sum of squares	df	Mean square	F	Sig
SYSPRE Between groups	634.467	2	317.233	1.897	.170
Within groups	4516.200	27	167.267		
Total	5150.667	29			
SYSPOST Between groups	7652.067	2	3826.033	32.739	.000
Within groups	3155.300	27	116.863		
Total	10807.367	29			
DIAPRE Between groups	232.800	2	116.400	2.353	.114
Within groups	1335.900	27	49.478		
Total	1568.700	29			
DIAPOST Between groups	1715.467	2	857.733	28.894	.000
Within groups	801.500	27	29.685		
Total	2516.967	29			
WHTPRE Between groups	.062	2	.031	5.628	.119
Within groups	.149	27	.036		
Total	.211	29			

WHTPOS Between groups	.056	2	.028	4.849	.016
Within groups	.155	27	.006		
Total	.211	29			

CHAPTER V

DISCUSSION

DISCUSSION

The present study was designed to find out and compare the effectiveness of Aerobics, HIIT and LVHIIT in the reduction of blood pressure and WHtr in hypertensive individuals.Even though all the three interventions were effective in significance level on reducing BP, little reduction was observed in waist to height ratio in all the three groups.Moreover,low volume high intensity training group exhibited excellent improvement comparatively in BP& waist circumference reduction.

CHAPTER VI

CONCLUSION

CONCLUSION

In primary hypertensive patients,aerobic exercise as gentle walking in moderate heart rate,HIIT,low volume HIIT with shortened exercise interval all can be beneficial in reducing systolic and diastolic BP and waist to height ratio.since LVHIIT group had shown greater significance and only moderate reduction in waist level by all the treatments,this study concludes that low volume HIIT could be more effective in reducing cardio vascular risk parameters of BP and WHtR but only average result may be seen in waist to height ratio.

CHAPTER VII

LIMITATIONS

•Limited sample size

•Treatment limited only for primary hypertensive subjects.

•High risk cardiovascular subjects are avoided.

CHAPTER VIII

SUGGESTIONS

Similar study can be undertaken on large scale or a longer duration with large sample size on even other cardio vascular risk parameters like obesity and diabetes etc.Other than tread mill, feasible method of exercise training convenient to all kind of populations may be employed like walking in open terrace with various speeds.

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APPENDIX –I

ASSESSMENT PERFORMA

PERFORMA FOR DATA COLLECTION

A. PERSONAL DETAILS

1. Name :
2. Age :
3. Sex :
4. Occupation :
5. Father's/Mother's name :
6. I.P. No. /O.P. No :
7. Date :
8. Address :
9. Cheif Complaints :

B. HISTORY OF PRESENT ILLNESS AND REVIEW OF SYSTEMS

General

The following characteristics of each symptom should be elicited and explored:

- Onset – sudden or gradual
- Location – radiation
- Duration – frequency, chronology
- Characteristics – quality, severity
- Aggravating and precipitating factors
- Relieving factors
- Current situation (improving or deteriorating)
- Effects on Activities of Daily Living (ADL)
- Previous diagnosis of similar episodes
- Previous treatments and efficacy

Cardinal Signs and Symptoms

In addition to the general characteristics outlined above, additional characteristics of specific symptoms should be elicited, as follows:

Cough

- Quality
- Severity
- Timing
- Duration: greater than 2 weeks (screen for Tuberculosis (TB)

Sputum

- Colour
- Amount
- Consistency
- Purulence, odour, foul taste
- Time of day, worse

Haemoptysis

- Amount of blood
- Frank blood or mixed with sputum
- Association with leg pain, chest pain, shortness of breath

Shortness of Breath

- Exercise tolerance (number of stairs client can climb or distance client can walk)
- Posture – orthopnea or tripoding
- Shortness of breath at rest
- Association with Paroxysmal Nocturnal Dyspnea (PND)
- Associated swelling of ankles or recent weight gain

Cyanosis

- Central vs peripheral

- When does it occur
- Any recent changes in pattern of
- Associated wheeze

Chest Pain

- Associated symptoms
- Relation to effort, exercise, meals, bending over
- Explore the pain carefully – include quality, radiation, severity, timing

Fainting or Syncope

- Weakness, light-headedness, loss of consciousness
- Relation to postural changes, vertigo or neurological symptom

Extremities

- Edema:

  - site

  – relation of edema to activity or time of day

- Intermittent claudication (exercise-induced leg pain)

  - distance client can walk before onset of pain related to claudication

  - time needed to rest to relieve claudication

  - temperature of affected tissue (warm, cool or cold)

- Tingling
- Leg cramps or pain at rest
- Presence of varicose veins

Other Associated Symptoms

- Fever
- Malaise
- Fatigue
- Night sweats
- Weight loss
- Palpitations
- Nausea and vomiting
- Gastro intestinal reflux

C. MEDICAL HISTORY SPECIFIC TO CARDIO-RESPIRATORY SYSTEMS

- Allergies, including seasonal and environmental
- Medications currently used (prescription and Over The Counter (OTC) e.g., angiotensinconverting
- enzyme (ACE) inhibitors, ß-blockers, (acetylsalicylic acid or ASA), steroids, nasal sprays and inhaled medications (puffers), antihistamines, hormones, diuretics, antacids, steroids, digoxin)
- Herbal/traditional preparations
- Immunizations (e.g., pneumococcal, annual influenza)
- Medical conditions:

  - Frequency of colds and respiratory infections, recent viral illness, joint pain or swelling

  - History of rheumatic fever

  - Nasal polyps, chronic sinusitis, asthma, bronchitis, pneumonia, chronic obstructive pulmonary disease (COPD), TB (disease or exposure), cancer, cystic fibrosis

  - Dyslipidemia, hypertension, diabetes mellitus, thyroid disorder, chronic renal disease, systemic lupus erythematosus

  - Coronary artery disease (CAD), angina, myocardial infarction (MI)

  - Cardiac murmurs, valvular heart disease

  - Down's Syndrome

- Date and result of last Mantoux test and chest x-ray

- Admissions to hospital and/or surgery for respiratory or cardiac illness
- Blood transfusion
- Family History (Specific to Cardio-respiratory Systems)

Family History (Specific to Cardio-respiratory Systems)

- Others at home with similar symptoms
- Allergies, atopy
- Asthma, lung cancer, TB, cystic fibrosis, bronchitis
- Diabetes mellitus
- Heart disease: hypertension, ischemic coronary artery disease, MI (especially in family members < 50 years of age), sudden death from cardiac disease, dyslipidemia, hypertrophic cardiomyopathy

Personal and Social History (Specific to Cardio-respiratory Systems)

- Smoking history (number of packages/day, number of years)
- Exposure to second hand smoke, wood smoke, pets, mould
- Crowded living conditions
- Poor personal or environmental cleanliness
- High stress levels (personal or occupational)
- Institutional living Occupational or environmental exposure to respiratory irritants (mining, forest fire fighting)
- Substance use (e.g., alcohol, caffeine, street drugs, including injection and inhaled drugs / solvents)
- Human immunodeficiency virus (HIV) risks
- Obesity
- Immigration or travel abroad

D. PHYSICAL ASSESSMENT

Examination of the ear, nose, and throat should also be carried out because of the interrelatedness between these systems and structures and the functioning of the lower respiratory tract.

Vital Signs

- Temperature
- Pulse
- Respiratory rate
- SpO2
- Blood pressure (BP)
- Peak flow

General Appearance

- Acutely or chronically ill
- Degree of comfort or distress
- Position to aid respiration (e.g., tripod)
- Diaphoresis
- Ability to speak a normal-length sentence without stopping to take a breath
- Colour
- Nutritional status
- Hydration status
- Mental staus

Inspection

- Colour, cyanosis
- Shape of chest
- Symmetry of chest movement
- Rate, rhythm and depth of respiration, respiratory distress
- Intercostal indrawing
- Use of accessory muscles
- Precordium: visible pulsations

- Chest wall scars, bruising, signs of trauma
- Jugular venous pressure (JVP)
- Color of conjunctiva
- Extremities
- Hands – edema, cyanosis, clubbing, nicotine stains, cap refill

- Feet and legs – changes in foot color with changes in leg position i.e., blanching with elevation, rubor with dependency, ulcers, varicose veins, edema (check sacrum if client is bedridden), colour (pigmentation, discoloration), distribution of hair Skin – rashes, lesions,

- Xanthomas

Palpation

- Tracheal position (midline)
- Chest wall tenderness or crepitus
- Respiratory excursion
- Tactile fremitus
- Spinal abnormality
- Nodes (axillary, supraclavicular, cervical)
- Masses
- Apical beat

- Point of maximum impulse (PMI) normally located at the fifth intercostal space, midclavicular line - Assess quality and intensity of apical beat

- Apical beat (PMI) may be laterally displaced, which indicates cardiomegaly

- Identify and assess pulsations and thrills
- Hepatomegaly, right upper quadrant (RUQ) tenderness
- Assess peripheral pulses

– radial, brachial, femoral, popliteal, posterior tibial, dorsalis pedis

- Check for synchrony of radial and femoral pulses

- Edema: pitting (rated 0 to 4) and level (how far up the feet and legs the edema extends) sacral edema

Percussion of lung fields

- Resonance

  - Increased resonance over hyperinflated areas

  - Dullness to percussion over areas of consolidation

  - Location and excursion of the diaphragh

Auscultation of lungs

- Listen for sounds of normal air entry before trying to identify abnormal sounds
- Degree of air entry throughout the chest (should be equal)
- Quality of breath sounds (e.g., bronchial, bronchovesicular, vesicular)
- Ratio of inspiration to expiration
- Adventitious sounds:
- Wheezes (rhonchi), crackles (rales), pleural rub, stridor, decreased breath sounds.

Auscultation of heart

- Listen to normal heart sounds before trying to identify murmurs
- Auscultate at aortic, pulmonic, Erb's point, tricuspid, and mitral. Attempt to identify:

  - Rate and rhythm

  - S1 and S2 sounds and their intensity

- Added heart sounds (S3 and S4), rubs, splitting of S2

-murmur

- Auscultate carotid arteries, abdominal aorta, renal arteries, iliac arteries, and femoral arteries for bruits

Associated Systems

A complete respiratory assessment includes the Ear, Nose and Throat (ENT) system

- Consider Gastro Intestinal (GI)/Genito-Urinary (GU) assessment if appropriate

E. DIAGNOSTIC TESTS

F. TREATMENT

- Aerobic exs
- HIIT&LVHIIT

APPENDIX-II

ETHICAL CLEARANCE

Ethically permission for the study will be obtained from the subjects and a written consent will be taken from each subject who participates in the study, As this study involve human subjects the Ethical Clearance has been obtained from the Ethical committee of PPG college of Physiotherapy, Coimbatore as per the Ethical guidelines for Bio-medical research on human subjects, 2000 ICMR, (Indian Council of Medical Research) New Delhi.

APPENDIX-III

PPG COLLEGE OF PHYSIOTHERAPY,
COIMBATORE.

Informed consent form

Name of Principal Investigator	271430207 Post graduate student
Name of Organization	SPARRC COIMATORE

This Informed Consent Form has two parts:

- Information Sheet (to share information about the research with you)
- Certificate of Consent (for signatures if you agree to take part)

You will be given a copy of the full Informed Consent Form

PART I: Information Sheet

Introduction

I, _____, Postgraduate student in the Department of Physiotherapy, PPG college of Physiotherapy, Coimbatore, am working on my dissertation titled "**EFFECTIVENESS OF CONVENTIONAL PHYSIOTHERAPY, HIGH INTENSITY INTERVAL TRAINING (HIIT) AND LOW VOLUME HIGH INTENSITY INTERVAL TRAINING (LOW VOLUME HIIT) ON BLOOD PRESSURE (BP), & WAIST TO HEIGHT RATIO (WHTR) IN PRIMARY HYPERTENSIVE INDIVIDUALS"**

".

I am going to give you information and invite you to be part of this research. You do not have to decide today whether or not you will participate in the research. Before you decide, you can talk to anyone you feel comfortable with about the research.

There may be some words that you do not understand. Please ask me to stop as we go through the information and I will take time to explain. If you have questions later, you can ask them and get yourself clarified.

Type of Research Intervention

In this study if you are selected, detailed history taking, clinical examination and routine investigations will be done.

Participant selection

Study group: Adult between age groups of 30-60 years presenting with history of brief history of Bronchiectasis.

Procedures and Protocol

Thirty patients who are between18 -50 years with PRIMARY HYPERTENSION will be recruited in study group after obtaining the informed consent. Detailed history, clinical examination and cardio vascular will be done. After explaining the procedure all the patients will bedivided into 3study groups each study group consisting of atleast 10 patients. First study group will be treated with Aerobic exercise. Second study group with HIIT and third study group with LVHIIT, outcome will be done for each study group at the end of treatment session. The data will be analysed statistically.

Duration: 6 months

Voluntary Participation

Your participation in this research is entirely voluntary. It is your choice whether you choose to participate or not, it will not affect our patient's treatment process.

Benefits

Personally you might be or may not be benefited in any way directly from the research. But by taking part in this research, you will be helping the scientific community.

Possible risks

There are no major physical risks for the person associated with these methods.

Reimbursements

You won't be given any monetary incentives or gifts for being a part of this research.

Confidentiality

The information that we collect from this research project will be kept confidential. Information about the patient that will be collected during the research will be put away and no-one but the researchers will be able to see it.

Right to Refuse or Withdraw

You do not have to take part in this research if you do not wish to do so. You may also stop participating in the research at any time you choose. It is your choice and all of your rights will still be respected.

Who to Contact

This proposal has been reviewed and approved by the Research and Ethical committee of PPG College of Physiotherapy, Coimbatore, which is a committee whose task it is to make sure that research participants are protected from harm.

You can ask me any more questions about any part of the research study, if you wish to. Do you have any questions?

PART II: Certificate of Consent

I have read the foregoing information, or it has been read to me. I have been explained the procedure and complications. I am willing to participate in the study. I have had the opportunity to ask questions about it and any questions that I have asked have been answered to my satisfaction. I consent voluntarily to participate as a participant in this research.

Name of Participant_____

Signature of Participant _____

Date _____Day/month/year

If illiterate a literate witness must sign (if possible, this person should be selected by the participant and should have no connection to the research team). Participants who are illiterate should include their thumb-print as well.

I have witnessed the accurate reading of the consent form to the potential participant, and the individual has had the opportunity to ask questions. I confirm that the individual has given consent freely.

Name of witness_____ Thumb print of participant

Signature of witness _____

Date _____

Statement by the researcher/person taking consent

I have accurately read out the information sheet to the potential participant, and to the best of my ability made sure that the participant understands the following treatment&procedures:

1.Blood pressure monitoring

2.waist to height ratio measurement

3. Tread mill walking and running with and without intervals.

I confirm that the participant was given an opportunity to ask questions about the study, and all the questions asked by the participant have been answered correctly and to the best of my ability. I confirm that the individual has not been coerced into giving consent, and the consent has been given freely and voluntarily.

A copy of this informed consent from has been provided to the participant.

Name of Researcher/person taking the consent_____

Signature of Researcher /person taking the consent_____

Date _____ Day/month/year